

THE ECOLOGY OF A TEMPORARY AND A PERMANENT
POND IN TASMANIA.

M. YASIN,
ZOOLOGY IV,
1967.

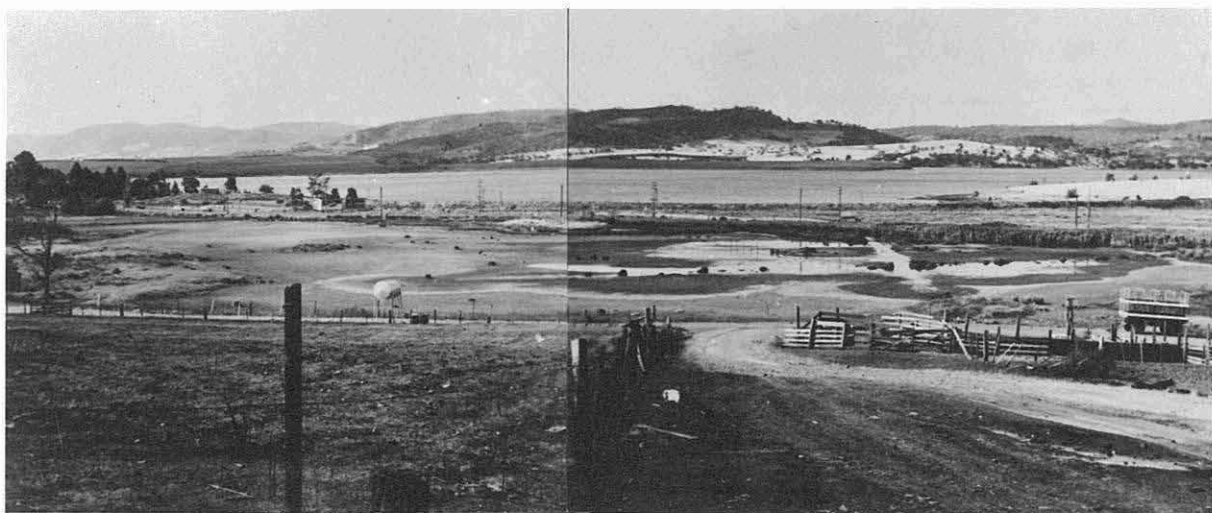


Plate 1. Granton Lagoon, March 1967, viewed from the south. The lagoon which is largely in a dry state is in the foreground, followed by the River Derwent, and the hills in the background.



Plate 2. Granton Lagoon, September 1967. The lagoon is completely under water.

Acknowledgments.

The study of pond ecology was both interesting and exciting. Thanks are due to the numerous people, who contributed to the success of this project, among whom are: Dr.I.S.Wilson, my Supervisor, who also read the manuscript and was a pleasure to work under; Dr.J.L.Hickman for his general advice and interest in my work; Dr.W.M.Curtis for her help in the identification of the flora; Mr.R.Wheeldon, the laboratory manager; and Mrs.M.Carter for typing this thesis.

I am indebted to the owners of the ponds who allowed me to study them: Mr.D.Weeks and Mr.N.Bester, who owned the Granton Lagoon; The Animals and Birds' Protection Board which also protects the Granton Lagoon as a private sanctuary; Mr.K.Calvert who owns the Calvert's Lagoon.

I am grateful to the Australian Colombo Plan authorities who have sponsored me during this study.

Contents.

	<u>Page</u>
I. Summary.	1
II. An Ecological Study of Granton Lagoon (Temporary Pond).	3
Introduction.	3
Methods and Results.	14
Physiochemical Studies.	16
Biological Observations.	35
Oversummering of organisms.	64
Discussion.	73
III. Laboratory Studies.	
Cyclomorphosis of <u>Daphnia carinata</u> .	83
The Osmotic Tolerance Range of <u>D. carinata</u> .	83
The Resistance of Ehippia to Desiccation.	84
Some Factors affecting Hatching of Ehippia.	88
IV. A Brief Ecological Study of Calvert's Lagoon (Permanent Pond).	
Introduction.	92
Physiochemical Studies.	93
Biological Studies - qualitative.	97
Comparison with Granton Lagoon.	100
V. A Comparison of the Growth Rate of an amphipod, <u>Austrochiltonia australis</u> in the two ponds.	103
VI. A Comparison of the Growth Rate of a calanoid, <u>Boeckella triarticulata</u> in the two ponds.	107

	<u>Page</u>
VII. General Discussion.	112
VIII. References.	116
General References.	116
References used for identification of organisms.	120
IX. Appendix.	
Diagram of three dominant Diatoms of Granton Lagoon.	122
Raw Data for Granton Lagoon.	123
Raw Data for Aves of a part of River Derwent.	129

I Summary

Two ponds, a temporary and a permanent, were investigated over a period of 7 months, the study of the temporary pond being the more detailed. Of the five physiochemical factors studied, it is improbable that any one factor caused all the observed biological changes, yet it seems that the incidence, abundance and succession of organisms followed temperature and depth of water more closely than any other factors. Laboratory studies were conducted to determine oversummering forms in dry soil. Ehippia, an oversummering form of Daphnia carinata, was quite resistant to desiccation. Factors affecting the hatching of ehippia were also examined. Daphnia itself was tolerant to a wide range of osmotic pressure. These observations showed the capacity of an organism well adapted to the rigors of the environment.

The permanent pond was studied only qualitatively. Its flora and fauna, especially the former, were less diverse than that of the temporary pond. This was probably due to high interspecific competition in the permanent pond where the organisms appeared to be persistent unlike the seasonal incidence, abundance and succession of organisms in the temporary pond which would reduce interspecific competition.

The growth rate of a calanoid and a amphipod were

greater in the temporary pond than in the permanent pond.
This could have been due to differences in trophic
conditions, predation and genetic differences.